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ABSTRACT

This document contains course materials for the minimum general and Koch-specific requirements for the fire suppression training and education portion of the integrated industrial emergency response team training program. The various levels of performance were developed with the National Fire standard 600, Private Fire Brigades. The training is designed to provide students with the minimum education and training to allow them to do the following tasks: perform safely either offensive or defensive fire suppression duties; use portable fire extinguishers from outside the hot zone; and attach or control incipient fires at a specific site. The 12 sections cover the following topics: duties and responsibilities; chemistry and behavior of a fire; hazards; fire safety concepts; extinguishing agents; portable fire extinguishers; safety; fire attack techniques; automatic fire detection; automatic sprinkler protection; fire protection water supplies; and special extinguishing systems. Each section contains objectives, references, and test questions. (KC)

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INCIPIENT I

Incipient I Fire Brigade Training & Certification

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Purpose of Training

Purpose of Training

The purpose of this course is to detail the minimum general and Koch-specific requirements for the fire suppression training and education portion of the integrated industrial emergency response team training program. The various levels of performance have been developed with the National Fire (NFPA) standard 600, Private Fire Brigades.

Fire Suppression Performance Levels of the Incipient I

At the Incipient I level, the industrial emergency responder is expected to perform, as a member of an organized team, assigned fire suppression duties.

The duties:

1. Include both offensive and defensive operations limited to incipient fires,

2. Do not require the use of either approve thermal protective clothing or approved SCBA,

3. Do not require personal evasive action to avoid the products of combustion,

4. Are limited to the use of portable fire extinguishers.

Training Overview

Training Goal

The goal of the Koch-specific fire suppression training program at the Incipient I level is to assure that the industrial emergency responder student is provided with the minimum education and training to allow him or her to:

1. Safely perform either offensive or defensive fire suppression duties,
2. Utilize portable fire extinguishes from outside of the hot zone,
3. Attach and/or control incipient fires at a specific site.

At the end of this training course, you will:

A. Understand the site-specific duties, responsibilities and limitations of the Incipient I Fire Brigade to ensure the safety of the fire brigade member.

B. Analyze fire situations that are likely to occur at Koch to determine how they are likely to behave.

C. Determine if and when fires are beyond the capability of the Incipient I Fire Brigade.

D. Understand the types and severity of the hazards found at Koch and the role which they plan with regard to fire brigade operations.

E. Understand how the components of Koch's fire safety system influence fire control and fire brigade operations.

F. Understand how the various fire extinguishing agents are used in extinguishing fires.

G. Select and explain the operation of the types of portable fire extinguishers used in the Incipient I Koch fire brigade.

Training Overview

At the end of this training course, you will: *(continued)*

H. Understand the aspects of personal safety while performing fire suppression duties.

I. Demonstrate fire attack techniques used by Koch's Incipient I fire brigade.

J. Understand the types of automatic fire detection devices installed at Koch and how they influence fire brigade operations.

K. Understand the types of automatic sprinkler systems installed at Koch and how they influence fire brigade operations.

L. Understand the components of Koch's fire protection water supply system and how they influence fire brigade operations.

M. Understand the special extinguishing systems installed at Koch and how they influence fire brigade operations.

A: Duties & Responsibilities

While completing Section A of the Incipient I training course, you will:

1. Explain the organizational structure of the Koch Refinery Fire Brigade

2. Explain the purpose of the Koch's Fire Brigade
   - Read organizational statement
   - Discuss the relationship with civic fire brigades
   - Discuss the relationship with state agencies & certification bodies

3. Analyze Koch's Emergency Action Plan
   - Analyze physical boundaries of the refinery
   - Determine the locations of all emergency exits in the facility
   - Discuss evacuation procedures for handicapped workers and visitors

4. List the duties and responsibilities within each level of the fire brigade
   - Analyze the duties of each level within the Koch refinery
   - Outline the training and education requirements for each level
   - Explain the role of each member in an emergency evacuation

References

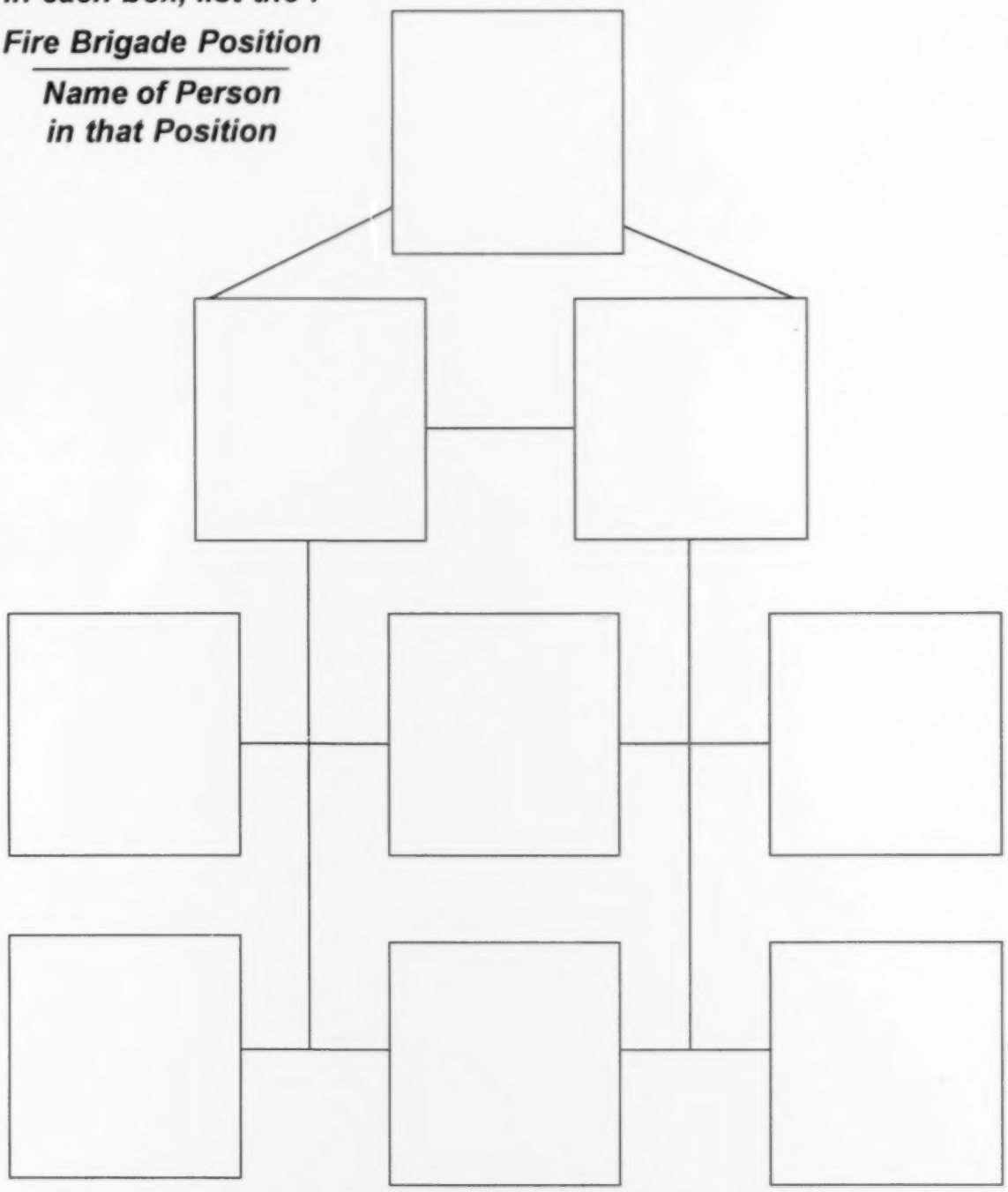
Worksheets located on pages 7 - 14 of this manual
Koch's Fire Brigade Organizational Statement
Koch's Emergency Action Plan

A: Duties & Responsibilities

In each box, list the :

Fire Brigade Position

Name of Person in that Position



A: Duties & Responsibilities

With your instructor, complete the following questions:

1. What is the purpose of the Koch Fire Brigade?

2. Restate the Fire Brigade's organizational statement in your own words.

3. What is the relationship between the Koch Fire Brigade and local fire brigades?

4. What is the relationship among Koch's Fire Brigade and various state agencies?

5. How are the Koch Fire Brigade instructors and Fire Brigade members certified?

A: Duties & Responsibilities

With your instructor, draft a map of the refinery's physical boundaries. Identify important elements of the property as it pertains to the Fire Brigade, including emergency exits.

A: Duties & Responsibilities

With your instructor, complete the following questions:

1. What are the evacuation procedures for assisting handicapped workers and visitors?

2. What is the role of an Incipient I Fire Brigade member in the evacuation procedures stated in question 1?

3. List the different levels of Koch Fire Brigade members:

Use pages 11 - 14 to understand:

The duties and responsibilities of the Koch Fire Brigade
The tools and equipment used by the Fire Brigade
The training requirements

Incipient I

Duties and responsibilities of an Incipient I:

Tools and equipment used by an Incipient I:

Training requirements:

Incipient II

Duties and responsibilities of an Incipient II:

Tools and equipment used by an Incipient II:

Training requirements:

Advanced Exterior I

Duties and responsibilities of an Advanced Exterior I:

Tools and equipment used by an Advanced Exterior I:

Training requirements:

Advanced Exterior II

Duties and responsibilities of an Advanced Exterior II:

Tools and equipment used by an Advanced Exterior II:

Training requirements:

Advanced Interior I

Duties and responsibilities of an Advanced Interior I:

Tools and equipment used by an Advanced Interior I:

Training requirements:

Advanced Interior II

Duties and responsibilities of an Advanced Interior II:

Tools and equipment used by an Advanced Interior II:

Training requirements:

Advanced Interior/Exterior I

Duties and responsibilities of an Advanced Interior/Exterior I:

Tools and equipment used by an Advanced Interior/Exterior I:

Training requirements:

Advanced Exterior II

Duties and responsibilities of an Advanced Interior/Exterior II:

Tools and equipment used by an Advanced Interior/Exterior II:

Training requirements:

B: Behavior of Fire

While completing Section B of the Incipient I training course, you will:

1. Define key terminology
2. Discuss the stages of fire
3. Discuss different examples of fuels
4. Discuss fire situations that are likely to happen at the Koch Refinery
5. Determine how fire situations are likely to behave at Koch
6. Determine if and when fire situations are beyond the capacity of Koch's Incipient I Fire Brigade

References

Essentials of Fire Fighting Text: Chapter One: Pages 1 - 22
Complete the Student Applications Worksheets: Pages 1 - 23

Your Notes

C: Hazards

While completing Section C of the Incipient I training course, you will:

1. Define key terminology
2. Explain how closed containers react when they are heated
3. Identify types of hazards found within the Koch Refinery
4. Determine the role of the Incipient I Fire Brigade and other members of the Fire Brigade when dealing with various hazards

References

Worksheets located on pages 18 - 21 of this manual

Essentials of Fire Fighting Text: Chapter One: Pages 1 - 22
Complete the Student Applications Worksheets: Pages 1 - 23

C: Hazards

With your instructor, complete the following:

1. Define flammable liquid and identify some examples of flammable liquids at the Koch Refinery.

2. Define combustible liquid and identify some examples of combustible liquids at the Koch Refinery.

3. Define flash point.

4. Define fire point.

5. Define explosive range.

6. Define autoignition temperature.

C: Hazards

With your instructor, complete the following:

7. Define specific gravity.

8. Define vapor density.

9. Explain how closed containers react when they are heated.

C: Hazards

With your instructor, list the types of Hazards found at the Koch Refinery. After you have completed the list, rate the hazards severity from 1 to 5. (5 = Most Severe)

Hazard	Rating
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	
11.	

C: Hazards

Using your list from Page 20, complete the boxes below:

Hazard: _____

Possible location(s) of hazard: _____

_____

Potential severity of hazard: _____

Role of Incipient I Fire Brigade: _____

_____

Role of other Fire Brigade members: _____

_____

Hazard: _____

Possible location(s) of hazard: _____

_____

Potential severity of hazard: _____

Role of Incipient I Fire Brigade: _____

_____

Role of other Fire Brigade members: _____

_____

Hazard: _____

Possible location(s) of hazard: _____

_____

Potential severity of hazard: _____

Role of Incipient I Fire Brigade: _____

_____

Role of other Fire Brigade members: _____

_____

C: Hazards

Using your list from Page 20, complete the boxes below:

Hazard: _____

Possible location(s) of hazard: _____

_____

Potential severity of hazard: _____

Role of Incipient I Fire Brigade: _____

_____

Role of other Fire Brigade members: _____

_____

Hazard: _____

Possible location(s) of hazard: _____

_____

Potential severity of hazard: _____

Role of Incipient I Fire Brigade: _____

_____

Role of other Fire Brigade members: _____

_____

Hazard: _____

Possible location(s) of hazard: _____

_____

Potential severity of hazard: _____

Role of Incipient I Fire Brigade: _____

_____

Role of other Fire Brigade members: _____

_____

C: Hazards

Using your list from Page 20, complete the boxes below:

Hazard: _____

Possible location(s) of hazard: _____

_____

Potential severity of hazard: _____

Role of Incipient I Fire Brigade: _____

_____

Role of other Fire Brigade members: _____

_____

Hazard: _____

Possible location(s) of hazard: _____

_____

Potential severity of hazard: _____

Role of Incipient I Fire Brigade: _____

_____

Role of other Fire Brigade members: _____

_____

Hazard: _____

Possible location(s) of hazard: _____

_____

Potential severity of hazard: _____

Role of Incipient I Fire Brigade: _____

_____

Role of other Fire Brigade members: _____

_____

D: Fire Safety Concepts

While completing Section D of the Incipient I training course, you will:

1. Define key terminology
2. Explain how closed containers react when they are heated
3. Identify types of hazards found within the Koch Refinery
4. Determine the role of the Incipient I Fire Brigade and other members of the Fire Brigade when dealing with various hazards

References

Worksheets located on pages 25 - 28 of this manual

D: Fire Safety Concepts

With your instructor, complete the following:

1. Define fire control.

   _____

   _____

2. Explain why an Incipient I should know the roles of the Underwriters Laboratories, Inc. (UL) and the Factory Mutual Research Corporation (FM).

   _____

   _____

   _____

   _____

3. How does the National Fire Protection Association influence the Koch Refinery Fire Brigade?

   _____

   _____

   _____

4. Define automatic fire suppression.

   _____

   _____

5. Define manual fire suppression.

   _____

   _____

6. Define fire cut-off.

   _____

   _____

D: Fire Safety Concepts

List and describe the components of Koch's fire safety system:

Component _____

Location(s) of component: _____

_____

Purpose of component: _____

Use of component by Incipient I Fire Brigade: _____

_____

Component _____

Location(s) of component: _____

_____

Purpose of component: _____

Use of component by Incipient I Fire Brigade: _____

_____

Component _____

Location(s) of component: _____

_____

Purpose of component: _____

Use of component by Incipient I Fire Brigade: _____

_____

D: Fire Safety Concepts

List and describe the components of Koch's fire safety system:

Component _____

Location(s) of component: _____

_____

Purpose of component: _____

Use of component by Incipient I Fire Brigade: _____

_____

Component _____

Location(s) of component: _____

_____

Purpose of component: _____

Use of component by Incipient I Fire Brigade: _____

_____

Component _____

Location(s) of component: _____

_____

Purpose of component: _____

Use of component by Incipient I Fire Brigade: _____

_____

D: Fire Safety Concepts

List and describe the components of Koch's fire safety system:

Component _____

Location(s) of component: _____

_____

Purpose of component: _____

Use of component by Incipient I Fire Brigade: _____

_____

Component _____

Location(s) of component: _____

_____

Purpose of component: _____

Use of component by Incipient I Fire Brigade: _____

_____

Component _____

Location(s) of component: _____

_____

Purpose of component: _____

Use of component by Incipient I Fire Brigade: _____

_____

E: Extinguishing Agents

While completing Section E of the Incipient I training course, you will:

1. List common types of extinguishing agents
2. Explain how water extinguishes fire by cooling, smothering and dilution
3. Explain how BC dry chemical extinguishers fight fire
4. Explain how ABC dry chemical extinguishers fight Class A fires
5. Explain how Halon extinguishers fight fire
6. Explain how carbon dioxide extinguishes fire
7. Explain how Class D agents extinguishers fight fire
8. List agents used on A, B, C and D fires
9. Calculate the maximum heat absorption capacity of a gallon of water when used as an extinguishing agent to control a fire
10. Explain how the heat absorption capacity of water determines the rate-of-flow required to control a fire

References

Essentials of Fire Fighting Text: Chapter Two: Pages 23 - 45
Training Sections E, F, G and H are located in Chapter Two

Complete the Student Applications Worksheets: Pages 1 - 36

F: Portable Fire Extinguishers

While completing Section F of the Incipient I training course, you will:

1. Define portable fire extinguisher
2. List extinguishers used on Class A, B, C and D fires
3. Explain the operation of pump tank water, pressurized water and loaded stream water fire extinguishers
4. Explain the operation of stored pressure and cartridge operated dry chemical fire extinguishers
5. Explain the operation of carbon dioxide and Halon fire extinguishers

References

Essentials of Fire Fighting Text: Chapter Two: Pages 23 - 45
Training Sections E, F, G and H are located in Chapter Two

Complete the Student Applications Worksheets: Pages 1 - 36

G: Safety

While completing Section G of the Incipient I training course, you will:

1. Explain why those employees assigned fire suppression duties are not to be assigned any duty for which they have not been trained

2. Explain the differences between an open structure, an enclosed structure and a building

3. Explain why the concern for the safety of those employees performing manual fire suppression duties differs when a fire is within an enclosed structure or a building as opposed to an outdoor area

4. Define and explain the purpose of defensive fire suppression operations

5. Define and explain the purpose of offensive fire suppression operations

6. Explain how to determine if a given fire is beyond the incipient stage

7. Explain the additional safety precautions which must be taken when performing manual fire suppression duties in an area protected by automatic sprinklers

8. Explain the safety precautions required when a total flooding special extinguishing system has been installed

9. Explain the purpose of the fire brigade personnel accountability system

10. Explain the purpose of the hot, warm and cold zones as they related to fire brigade operations at fire emergencies

G: Safety

While completing Section G of the Incipient I training course, you will:

11. Explain the incident management system

12. Explain the limitations of the Incipient Fire Brigade in fighting incipient fires

13. Explain the types of clothing worn by the Incipient Fire Brigade while fighting fires

References

Essentials of Fire Fighting Text: Chapter Two: Pages 23 - 45
Training Sections E, F, G and H are located in Chapter Two

Essentials of Fire Fighting Text: Selections from Chapter 19: Pages 551 - 554

Worksheets located on pages 33 - 34 of this manual

G: Safety

With your instructor, complete the following:

1. What are the differences among open structures, enclosed structures and buildings?

2. Regarding safety techniques, what are the differences between fighting fires in enclosed structures versus outdoor areas?

3. Explain the differences between defensive and offensive fire suppression operations.

4. When is a fire beyond the Incipient stage?

5. What additional safety precautions should you take when fighting fires in areas with automatic sprinkler protection?

G: Safety

With your instructor, complete the following:

6. What additional precautions would you take when fighting fires where a total flooding special extinguishing system has been installed?

7. Explain Koch's personnel accountability system.

8. Why is it important for an Incipient I understand the hot, warm and cold zones as they relate to fire emergencies?

9. What type of incident management system does Koch have?

10. Explain the types of clothing and safety gear an Incipient I would use while fighting fires.

11. Explain the limitations of the Incipient Fire Brigade while fighting fires.

H: Fire Attack Techniques

While completing Section H of the Incipient I training course, you will:

1. Demonstrate the use of fire extinguishers to fight Class A fires
2. Demonstrate the use of fire extinguishers to fight Class B fires
3. Demonstrate the use of fire extinguishers to fight Class C fires

Demonstrate skills in the operation of:

Pump-tank water fire extinguishers: Page SA 2-11
Stored-pressure water fire extinguishers: Page SA 2-13
Aqueous film forming foam fire extinguishers: Page SA 2-15
Halon 1211 fire extinguishers: Page SA 2-17
Carbon dioxide fire extinguishers: Page SA 2-19
Ordinary base dry chemical extinguishers: Page SA 2-21
Multipurpose base dry chemical extinguishers: Page SA 2-23

I: Automatic Fire Detection

While completing Section I of the Incipient I training course, you will:

1. List the types of automatic fire detectors located at Koch
2. Explain the purpose of ionization and photoelectric smoke detectors
3. Explain the purpose of rate-of-rise and fixed temperature heat detectors
4. Explain the purpose of infrared and ultraviolet flame detectors

References: Selected Parts of Chapter 17 Only

Essentials of Fire Fighting Text: Chapter 17: Pages 501 - 515
Complete the Student Applications Worksheets: 1 - 42

Worksheet located on Page 37

I: Automatic Fire Detection

With your instructor, complete the following:

1. List the types of automatic fire detectors located at Koch

_____
_____
_____

2. Describe the types of smoke detectors located at the Koch Refinery.

_____
_____
_____
_____

3. Describe the types of heat detectors located at the Koch Refinery.

_____
_____
_____
_____

4. Describe the types of flame detectors located at the Koch Refinery.

_____
_____
_____
_____

J: Automatic Sprinklers

While completing Section J of the Incipient I training course, you will:

1. Explain the purpose of an automatic sprinkler system
2. Explain the operation of an automatic sprinkler system
3. List reasons why sprinkler systems fail to control fire
4. Explain what automatic sprinkler systems are expected to accomplish
5. Explain the purpose of the sprinkler system control valve

References: Selected Parts of Chapter 13 Only

Essentials of Fire Fighting Text: Chapter 13: Pages 433 - 449
Complete the Student Applications Worksheets: Pages 1 - 42

Worksheet located on Page 39

J: Automatic Sprinklers

With your instructor, complete the following:

1. Explain the purpose of an automatic sprinkler system.

2. Explain the operation Koch's automatic sprinkler system.

3. List reasons why sprinkler systems fail to control fire.

4. Explain what automatic sprinkler systems are expected to accomplish.

5. Explain the purpose of the sprinkler system control valve.

K: Water Supplies

While completing Section K of the Incipient I training course, you will:

1. Identify and explain the operation of various valves
2. Identify and explain the purpose of fire hydrants
3. Explain the purpose of a hose house
4. Define Koch's fire protection water supply

References:

Worksheets located on Page 41 and 42

K: Water Supplies

With your instructor, list the types of valves located within the Koch water supply system. Explain the operation of each valve.

Valve	Operation
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	
11.	

K: Water Supplies

With your instructor, complete the following:

1. What is the purpose of a fire hydrant?

2. What is the purpose of a hose house?

3. Define fire protection water supply?

L: Special Extinguishing Systems

While completing Section L of the Incipient I training course, you will:

1. Define special extinguishing systems
2. List agents used in special extinguishing systems
3. Define total flooding
4. Define local application
5. Identify a high pressure carbon dioxide system
6. Identify a low pressure carbon dioxide system
7. Identify a Halon 1301 system
8. Identify a dry chemical system
9. Identify a mechanical foam system

References:

Worksheet located on Page 44 and 45

L: Special Extinguishing Systems

With your instructor, complete the following:

1. Identify the special extinguishing systems used at the Koch Refinery.

2. List four agents used in special extinguishing systems.

3. Define total flooding.

4. Define local application.

5. What is the difference between a high pressure and a low pressure carbon dioxide system?

L: Special Extinguishing Systems

With your instructor, complete the following:

6. Identify a Halon 1301 system used at Koch and explain its functions.

_____
_____
_____
_____

7. Identify a dry chemical system used at Koch and explain its functions.

_____
_____
_____
_____

8. Identify a mechanical foam system used at Koch and explain its functions.

_____
_____
_____
_____